

Statement of Work

I. WA Title: Preprocessing LOCA Model Outputs for HAWQS
Contractor Name: IEC
Contract # EP-D-14-032
Option Period 3
WA # 3-34
Period of Performance: September 16, 2017 – September 15, 2018

II. Work Assignment Managers (WAM):

| | |
|--------------------------------------|--------------------------------------|
| WAM: Karen Metchis | Alt. WAM: Joel Corona |
| U.S. Environmental Protection Agency | U.S. Environmental Protection Agency |
| Office of Water | Office of Water |
| Water Policy Staff (M/C 4101M) | Water Policy Staff (Mail Code 4101M) |
| Washington, D.C. 20460 | Washington, D.C. 20460 |
| Phone: (202) 564-0734 | Phone: (202) 564-0006 |

III. Background:

The Hydrologic and Water Quality System (HAWQS) is a web-based interactive water quantity and quality modeling system that employs as its core modeling engine the Soil and Water Assessment Tool (SWAT), an internationally-recognized public domain model. HAWQS provides users with interactive web interfaces and maps; pre-loaded input data; outputs that include tables, charts, and raw output data; a user guide, and online development, execution, and storage of a user's modeling projects.

HAWQS substantially enhances the usability of SWAT to simulate the effects of management practices based on an extensive array of crops, soils, natural vegetation types, land uses, and weather for hydrology and the following water quality parameters:

| | |
|--------------------------|-------------------|
| Sediment | Dissolved oxygen |
| Pathogens | Pesticides |
| Nutrients | Water temperature |
| Biological oxygen demand | |

The United States Environmental Protection Agency (USEPA) Office of Water supports and provides project management and funding for HAWQS. The Texas A&M University Spatial Sciences Laboratory and EPA subject matter experts provide ongoing technical support including system design, modeling, and software development. The United States Department of Agriculture (USDA) and Texas A&M University jointly developed SWAT and have actively supported the model for more than 25 years.

HAWQS beta was released in June 2016. Additional features are being added to enhance end-user modeling options scalable to various regions and watersheds. By adding additional preprocessed projections, HAWQS will help water resource managers make informed, robust and resilient water management decisions.

IV. Description and Tasks:

This task is supported within the Contract SOW pursuant to Section 4, subsection h:

Section 4: Conduct and Support Risk Analyses. Upon EPA direction, the Contractor shall provide support to the EPA on risk analyses conducted in-house. This support shall include, but not be limited to:

Subsection h: developing sub-models required as part of overall risk model based on input from EPA risk team and consideration for literature and latest methods.

Task #1: Work Plan

The Contractor shall develop a work plan that details the QA/QC procedures that they will employ under this effort. The Contractor shall hold a conference call with the WAM to initiate work after approval of the work plan.

Task #2: Preprocessing GCMs

Consistent with the procedures used in Fant et al. (2017), the contractor shall process 14 additional sets of projections through 2100 for use in the HAWQS modeling platform. The 14 projections are comprised of seven general circulation models under two RCPs from the 2016 LOCA dataset (BuRec 2016). The list of models will be provided to the Contractor by the WAM. Using the available temperature and precipitation data within LOCA, the contractor shall use the historical binning approach applied for Fant et al. (2017) to develop internally-consistent projections for other variables needed by HAWQS. The LOCA projections should be scaled to the 8-digit and 10-digit hydrologic unit codes (HUCs) of the contiguous U.S., and provided to EPA and HAWQS modelers for conducting simulations.

V. QA Requirements:

Upon final delivery, the Contractor shall provide a QA memo to the WAM discussing QA performed, the data used with respect to precision, accuracy, representativeness, comparability, completeness, sensitivity and appropriateness as it applies to this use and its source. The QA memo will discuss how the Contractor and the Agency ensured that the environmental data were of acceptable quality and that they were being used for the purpose for which they were collected.

VI. Deliverables:

Consistent with prior preprocessing efforts, the results shall be supplied to the WAM in the format to be specified by Texas A&M University for input into HAWQS. The Contractor shall adhere to the following schedule:

| Task | Deliverable | Delivery Schedule |
|-------------|--------------------|------------------------------------|
| 1 | Work Plan | 20 days after effective date of WA |
| 2 | Deliverable | 4 weeks after effective date of WA |

VII. Reporting Requirements:

The Contractor shall provide monthly progress reports that include QA performed in accordance with the terms of the contract. The Contractor shall submit work products in electronic form. The Contractor shall alert the WAM via email of any issues that need resolution as needed.